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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/809,772	03/16/2001	Toshihiro Murayama	09792909-4792	8782

26263 7590 07/17/2002

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EXAMINER

PATEL, ISHWARBHAI B

ART UNIT PAPER NUMBER

2827

DATE MAILED: 07/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/809,772

Applicant(s)

MURAYAMA ET AL.

Examiner

Ishwar (I. B.) Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 15-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Mach 16, 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Newly submitted claims 15-20 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 15-20 are method claims classified in class 29, subclass 832, whereas the original claims are structural claims classified in class 361, subclass 760. Further the product as claimed can be made by different process, such as using male / female connections of the spacer, or using solder at both the ends or using adhesive at both ends or welding the spacers to the boards.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 15-20 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Drawings

2. The corrected or substitute drawings as mentioned in the response have not been received. Please note.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

"wherein the second connector has a lower thermal characteristic than the first connector which allows the second connector to loosen and separate from the second surface when heat and force are applied to the plurality of the circuit board" is not clearly indicating what property the applicant is considering. Whether expansion / contraction, or melting or bonding property!

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1,3,5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akram et al., US Patent No. 5,994,166, hereafter referred to as Akram, in view of Tomita, US Patent No. 6,344,682 and Dockerty et al., US Patent 6,395,991, hereafter Dockerty and Satoh et al., US Patent No. 5,276,289.

Regarding claims 1,3, 5, and 8 (8 as understood), Akram discloses an electronic circuit device comprising: a plurality of circuit boards which have electronic parts

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mounted thereon, the plurality of circuit boards are stacked in the thickness direction by metal pieces fixed between the circuit boards (substrate 402, 440 and 462 stacked one above the other with electric connection 450 and 472, see figure 4, column 7, line 26 to column 8, line 24). Though Akram discloses the electric connection can be formed from industry standards solder forming techniques or from other known materials and techniques such as conductive adhesives, Z-axis conductive material etc, column 3, line 55-60, fail to explicitly disclose the opposite ends of each metal piece are fixed to opposing circuit board by material which have different melting point). However such electric connection of the spacer member using material with different melting point is known in the art, apparently for easy assembly and dismantling during repair. Dockerty and Satoh disclose such structure with different melting point and Tomita discloses using epoxy resin on one end (see Tomita, column 3, line 1-5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the assembly of Akram stacked with metal piece fixed to opposing circuit board by material which have different melting point as taught by Dockerty, Satoh and Tomita in order to get the assembly with easy assembly and dismantling during repair.

Regarding claim 4, the modified assembly of Akram further discloses, the said conductive adhesive agent is conductive adhesive agent and the circuit boards are electrically connected to each other by said metal pieces (Akram column 3, line 55-60, and Tomita column 3, line 1-5).

Regarding claim 7, though the modified assembly of Akram does not explicitly disclose the electronic parts are soldered with the solder having higher melting point, it will depend upon the type of assembly, the component and the way it is to be dismantled. If parts are not to be separated, it is better to use the material with higher melting point for the parts attachment, apparently, to avoid the damage of parts connection while assembly and dismantling. Satoh and Dockerty disclose using such various solder materials, as required, for easy assembly and dismantling. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the assembly of Akram with the electronic parts soldered with the solder having higher melting point as taught by Satoh and Dockerty in order to avoid damage to the parts connection while dismantling or assembly of the system.

Regarding claims 9 to 13, the modified assembly of Akram discloses all the features of the claimed invention as applied to claims 1 to 8 above.

Regarding claim 14, though modified assembly of Akram does not disclose explicitly the shape of the spacer, it will depend upon the relative space available on both the opposite substrate, type of connection material used to get required connection strength and mainly cost effective method with which the spacer can be made. Further, the applicant is not claiming any specific advantage of one shape over the other. Therefore, it would have been obvious to one having ordinary skill in the art at the time

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the invention was made to provide the assembly of Akram with tapered spacer in order to have the spacer strong enough for the specific assembly and cost effective.

Response to Arguments

7. Applicant's arguments with respect to claims 1, 3 and 5 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Interrante et al., and Hinrichsmeyer et al., disclose electronic assembly similar to applicant's claimed invention.

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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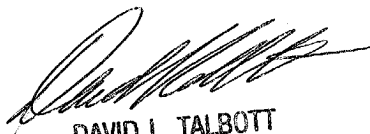
shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (6:30 - 4) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (703) 305 9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3431 for regular communications and (703) 305 7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

ibp
July 9, 2002


DAVID L. TALBOTT
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